

## Alexey Galda, Ph.D.

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### EDUCATION

**Ph.D. in Theoretical Physics**, *University of Birmingham (UK)*, December 2012

**B.Sc. in Applied Mathematics and Physics**, *Moscow Institute of Physics and Technology*, June 2008  
(*summa cum laude*, 5.0/5.0 GPA)

### RESEARCH INTERESTS AND EXPERTISE

- Superconductivity, theory of fluctuations
- Electron transport and theory of low-dimensional quantum systems
- Physics of vortex matter
- Theory of superconductor-insulator transition
- Spin-torque switching in magnetic micro- and nanostructures

### PROFESSIONAL EXPERIENCE

**Argonne National Laboratory**, Materials Science Division

*Postdoctoral Researcher*

*10/2012 – Present*

- Predicted the existence of a novel fluctuation effect in Josephson Junctions. Developed a theory of fluctuation Shapiro resonances above the superconducting critical temperature. Initiated an experimental collaboration aimed at validating the theoretical results.
- Developed a theory of Gaussian fluctuations in superconductors with quenched disorder to explain thermodynamic properties of heavy-ion irradiated high- $T_c$  superconducting materials.
- Studied stability of multi-quanta vortices in bounded critical superconductors.
- Discovered a new NMR relaxation mechanism in disordered two-dimensional superconductors in strong magnetic fields.
- Studied nonlinear magnetization dynamics induced by spin-polarized currents in anisotropic magnetic nanoparticles. Derived the condition for the existence and stability of non-trivial excited static and oscillating states in magnetic nanopillars.
- Discovered critical behaviour at the dynamic Mott transition in frustrated superconducting arrays.

**University of Birmingham, UK**

*Graduate Student Researcher*

*09/2008 – 10/2012*

- Studied single impurity problem in a one-dimensional system of interacting electrons in presence of electron-phonon coupling. Predicted a phase diagram with up to three fixed points and a possibility of a metal-insulator transition.
- Discovered the existence of a duality relation between the limits of weak and strong impurity scattering.

### AWARDS/SCHOLARSHIPS

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| ✓ Moreton Prize, University of Birmingham  | 2012, 2011 |
| ✓ Postgraduate Teaching Assistantship, University of Birmingham                                | 2009       |
| ✓ Midlands Physics Alliance Graduate School Scholarship (Full Tuition and Stipend for 4 years) | 2008       |
| ✓ Overseas Research Student Scholarship (Full Tuition and Stipend for 4 years), UK             | 2008       |
| ✓ HSP Huygens Scholarship (Full Tuition and Stipend for 2 years, declined), Netherlands        | 2008       |

### SERVICES

- Reviewer for Theoretical Condensed Matter Physics Program at US Department of Energy
- Contributed to writing and reporting of US Department of Energy-funded FWP project

## SELECTED PUBLICATIONS

Alexey Galda, A.S. Mel'nikov, V.M. Vinokur

"Resonant tunneling of fluctuation Cooper pairs",  
*Nature Scientific Reports*, **5**, 8315 (2015) ([online](#))

I.V. Yurkevich, Alexey Galda, O.M. Yevtushenko, Igor V. Lerner

"Duality of Weak and Strong Scatterer in a Luttinger liquid Coupled to Massless Bosons",  
*Physical Review Letters* **110**, 136405 (2013) ([online](#))

Alexey Galda, I.V. Yurkevich, Igor V. Lerner

"Effect of electron-phonon coupling on transmission through Luttinger Liquid hybridized with resonant level", *Europhysics Letters* **93**, 17009 (2011) ([online](#))

Alexey Galda, I.V. Yurkevich, Igor V. Lerner

"Impurity Scattering in a Luttinger Liquid with Electron-Phonon Coupling",  
*Physical Review B* **83**, 041106(R) (2011), (*Rapid Communications, Editor's Suggestion*) ([online](#))